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FIG. 1
(PRIOR ART)

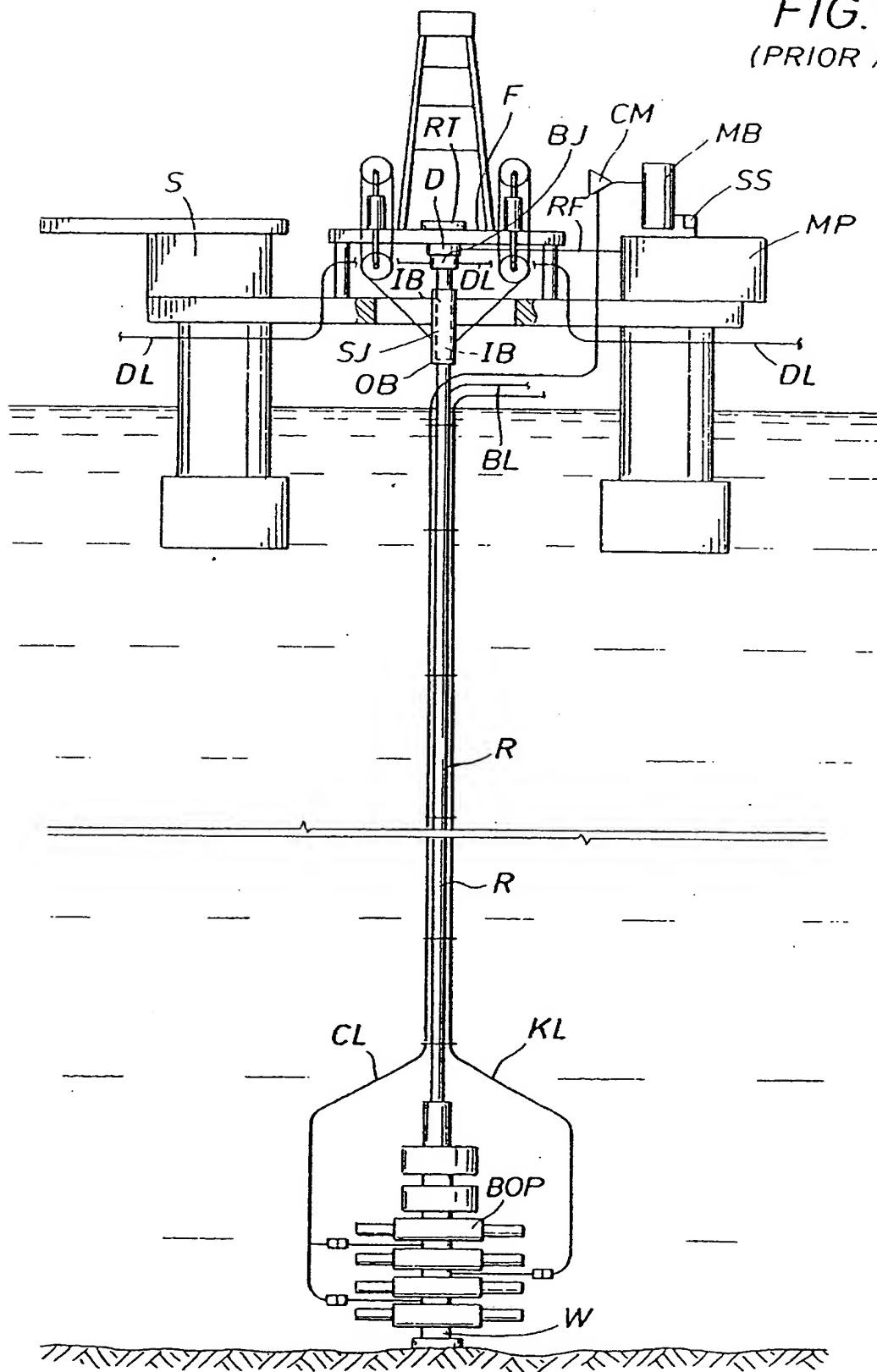
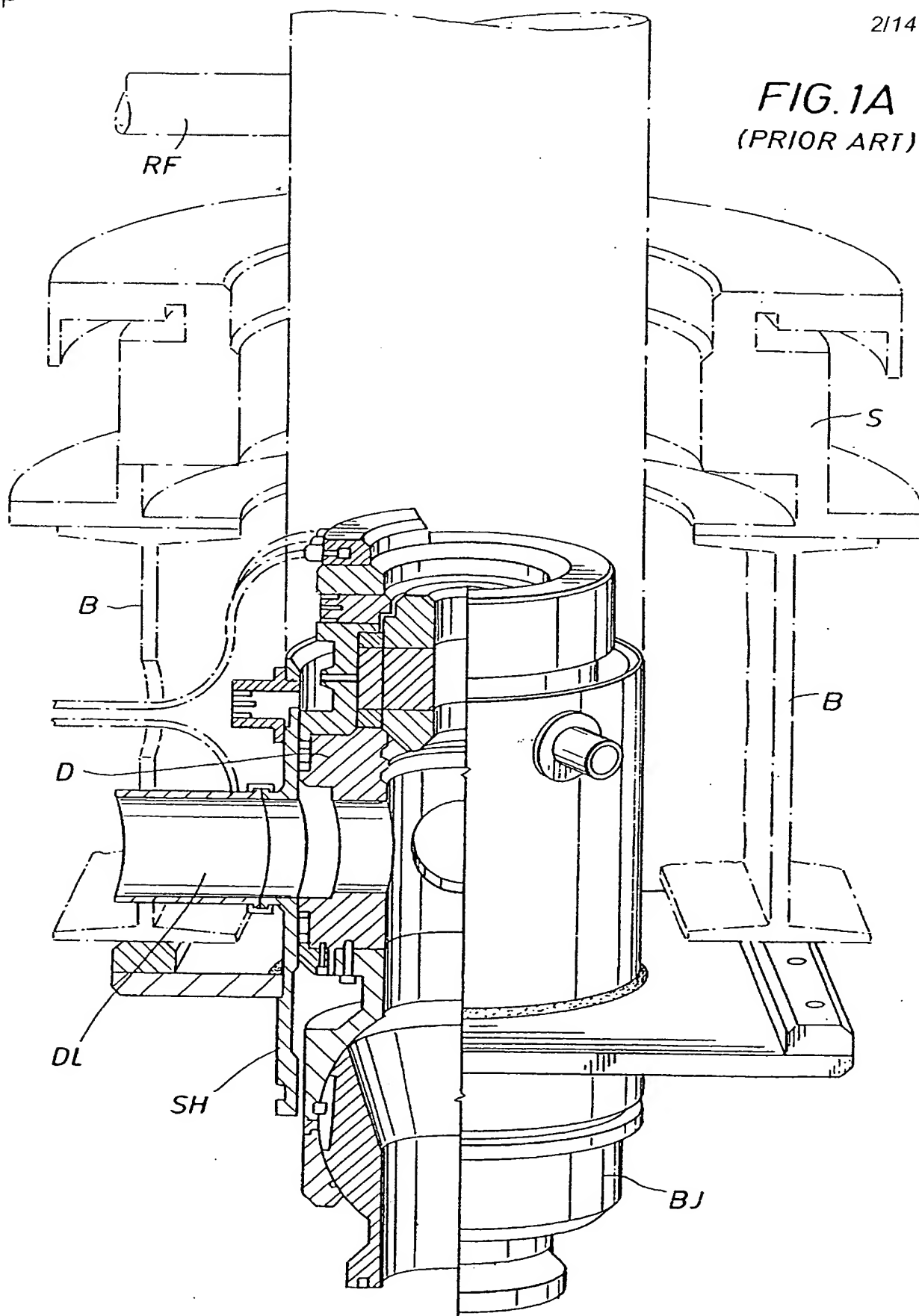


FIG. 1A
(PRIOR ART)



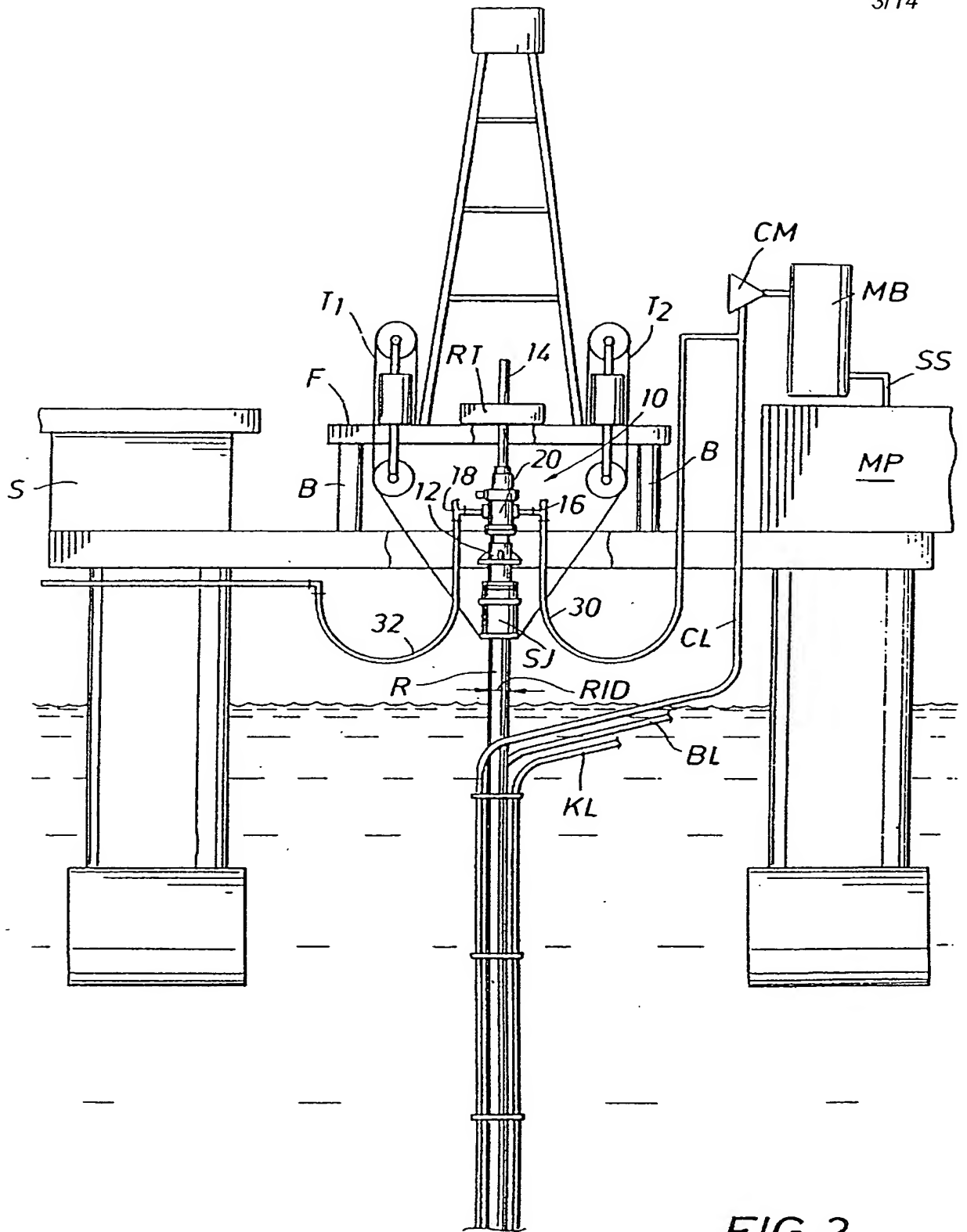
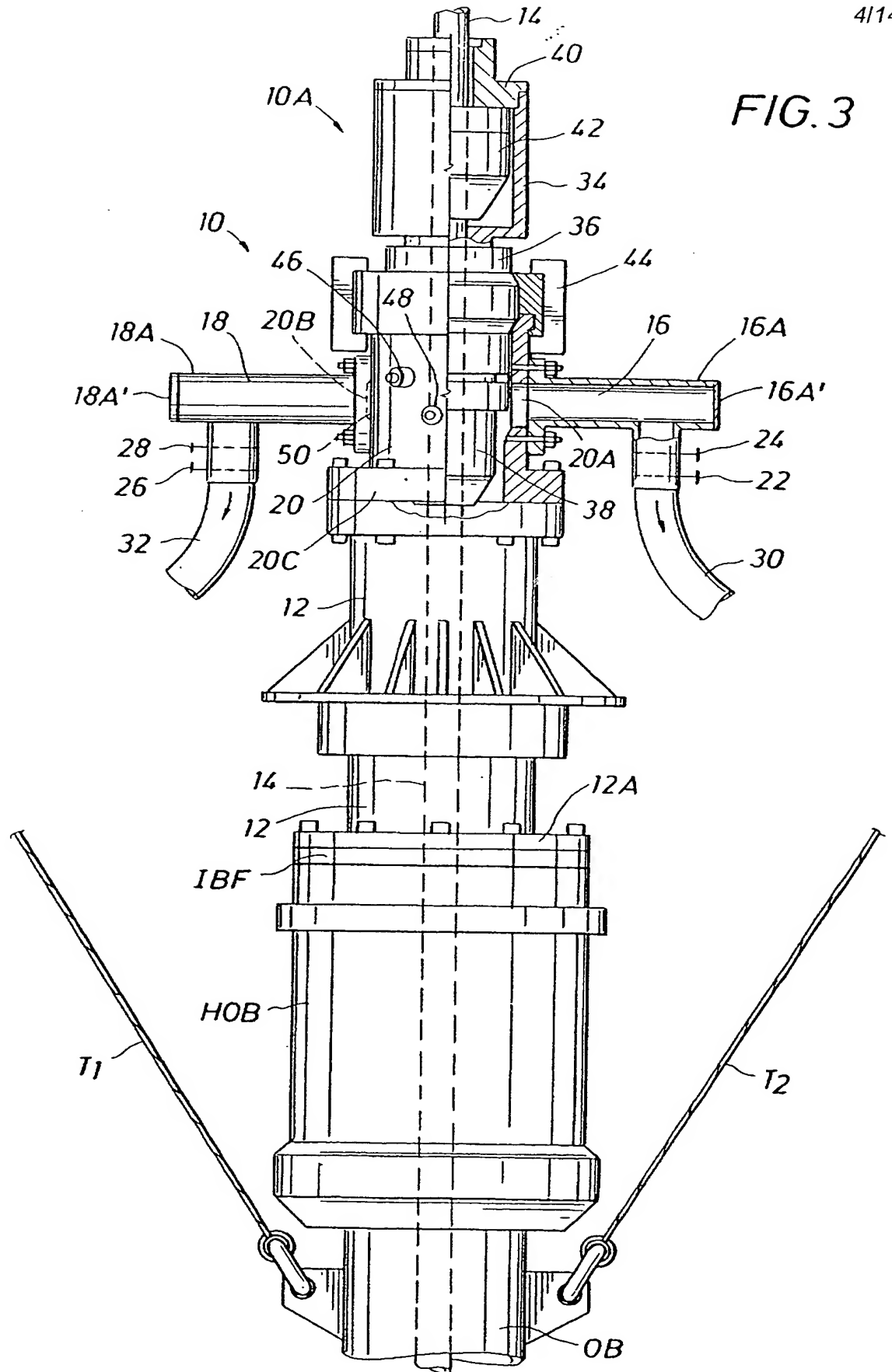


FIG. 3



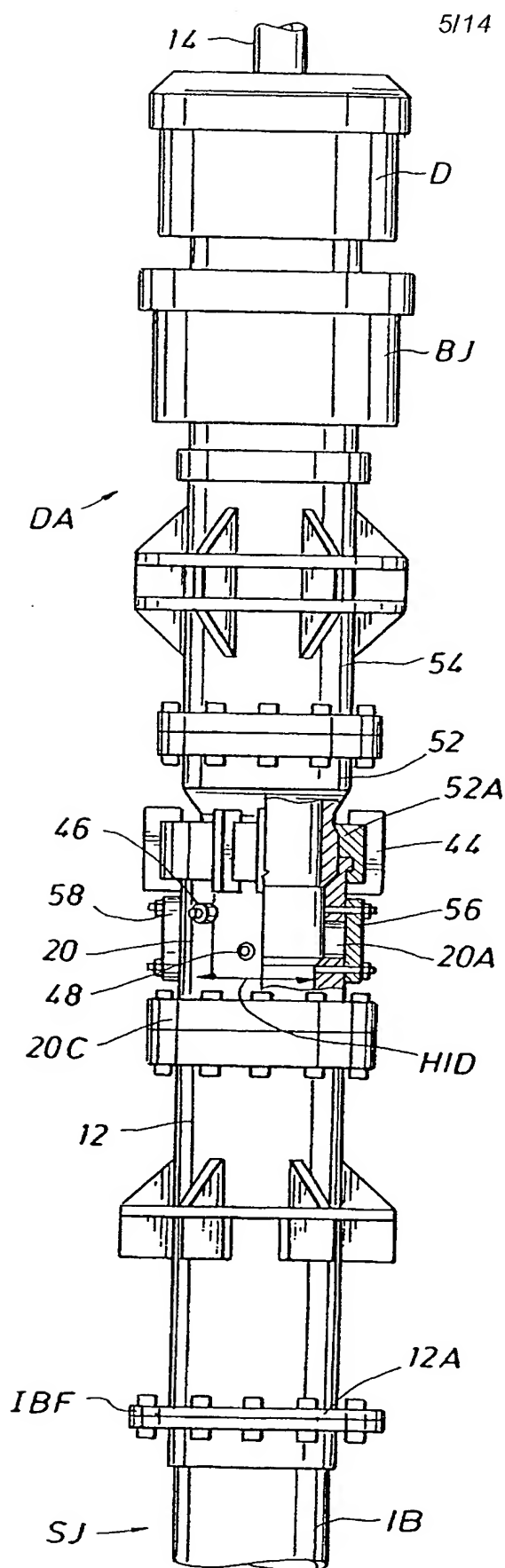


FIG. 4

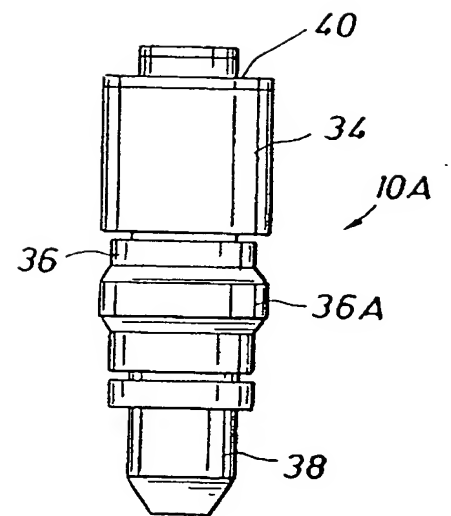


FIG. 5

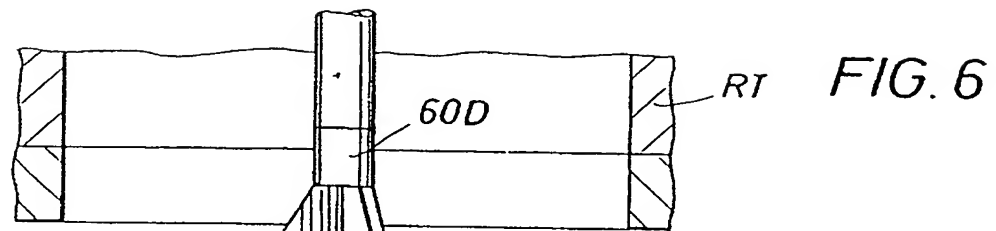


FIG. 6

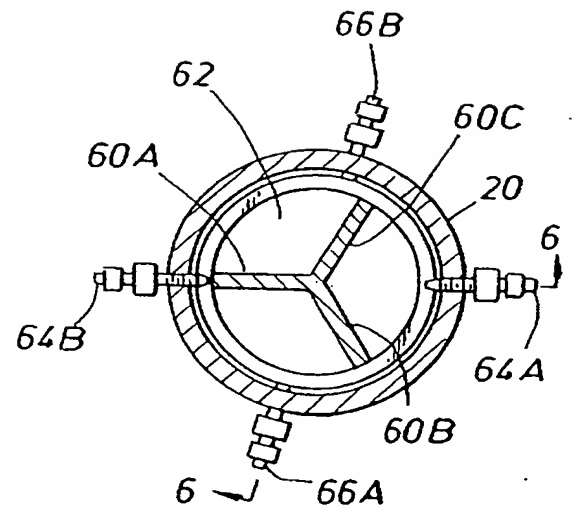
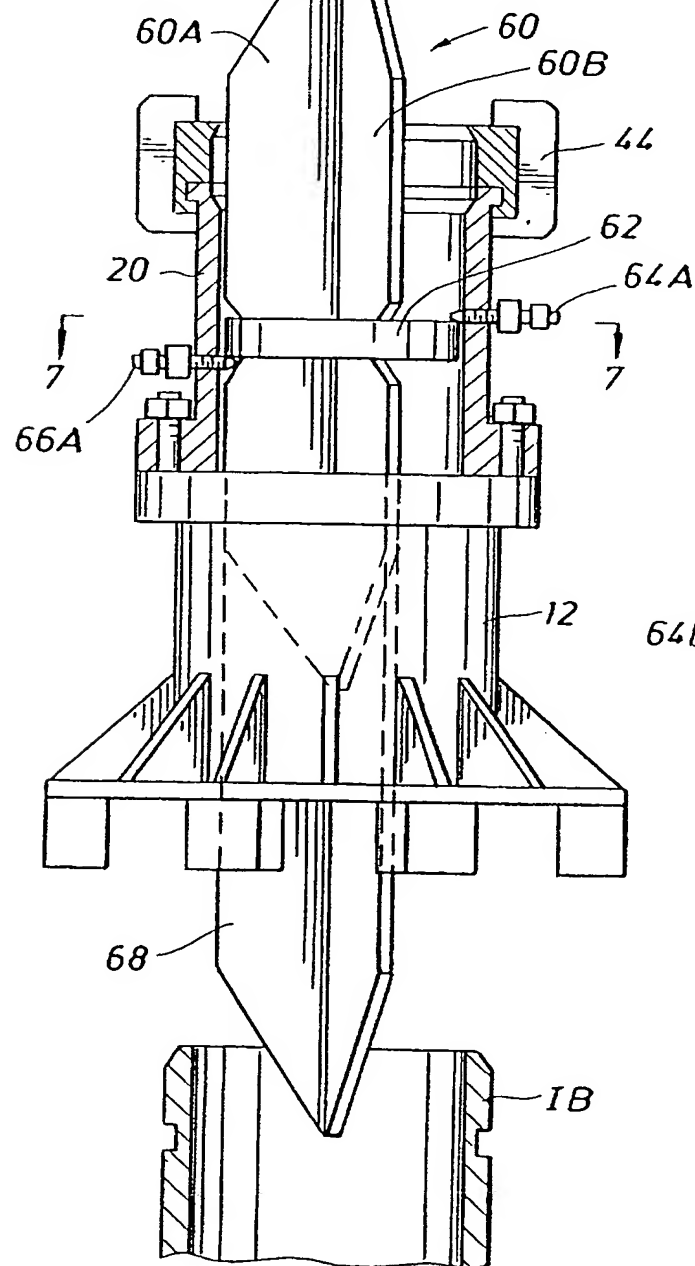


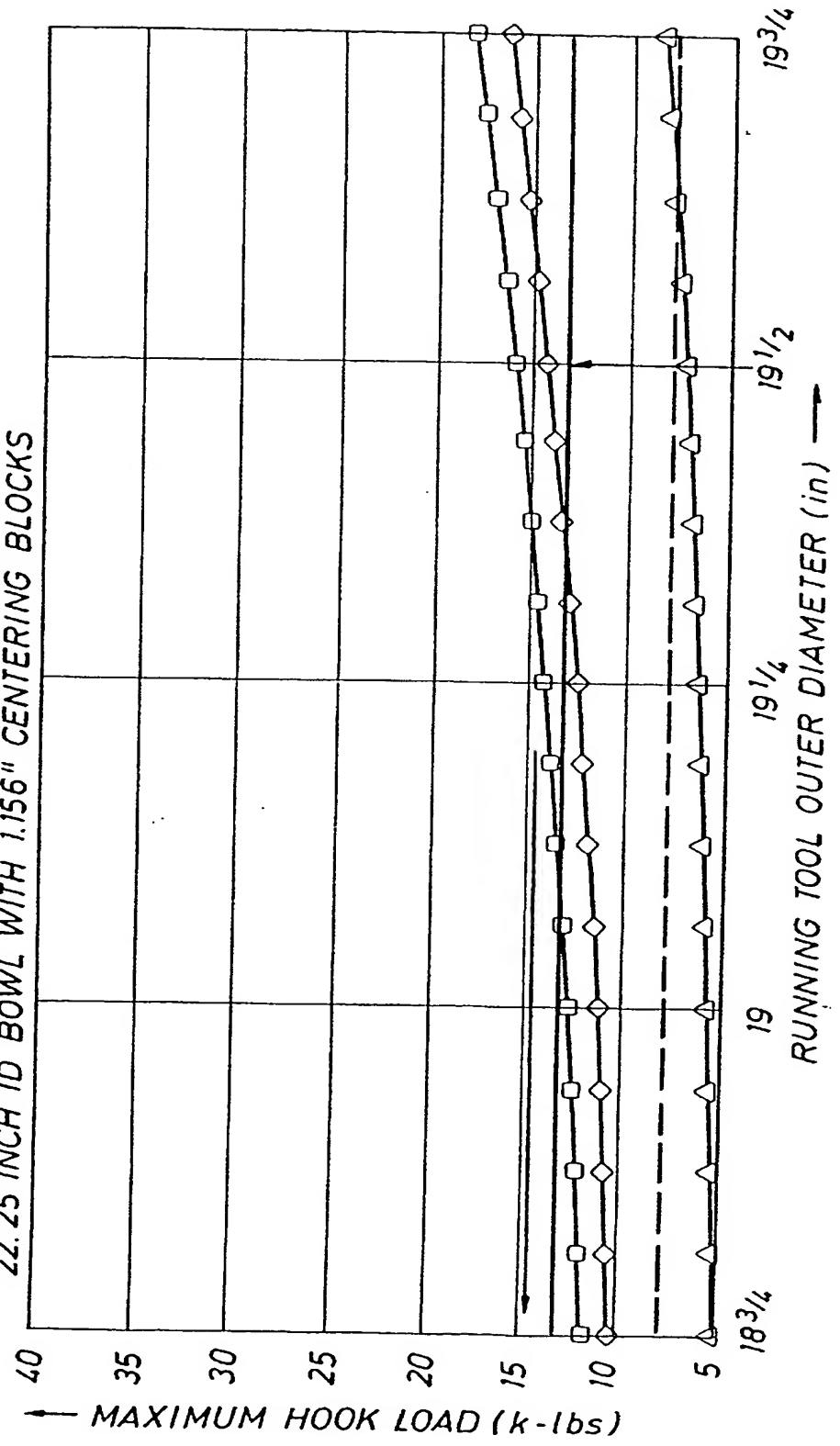
FIG. 7



FIG. 8

FIG. 9

—◇— MAX HOOK LOAD - ECENTRIC RUNNING TOOL
 —□— MAX HOOK LOAD - TAPERED PINS
 —△— MAX PIN LOAD - FULLY ECENTRIC RUNNING TOOL WITHOUT CENTERING BLOCKS
 ——— WORSE CASE INNER BARREL WEIGHT
 - - - MOST LIKELY INNER BARREL WEIGHT
 40,000 psi YIELD STRENGTH IN MATERIAL
 1.5 INCH MINIMUM PIN TAPER DIAMETER
 22.25 INCH ID BOWL WITH 1.156" CENTERING BLOCKS

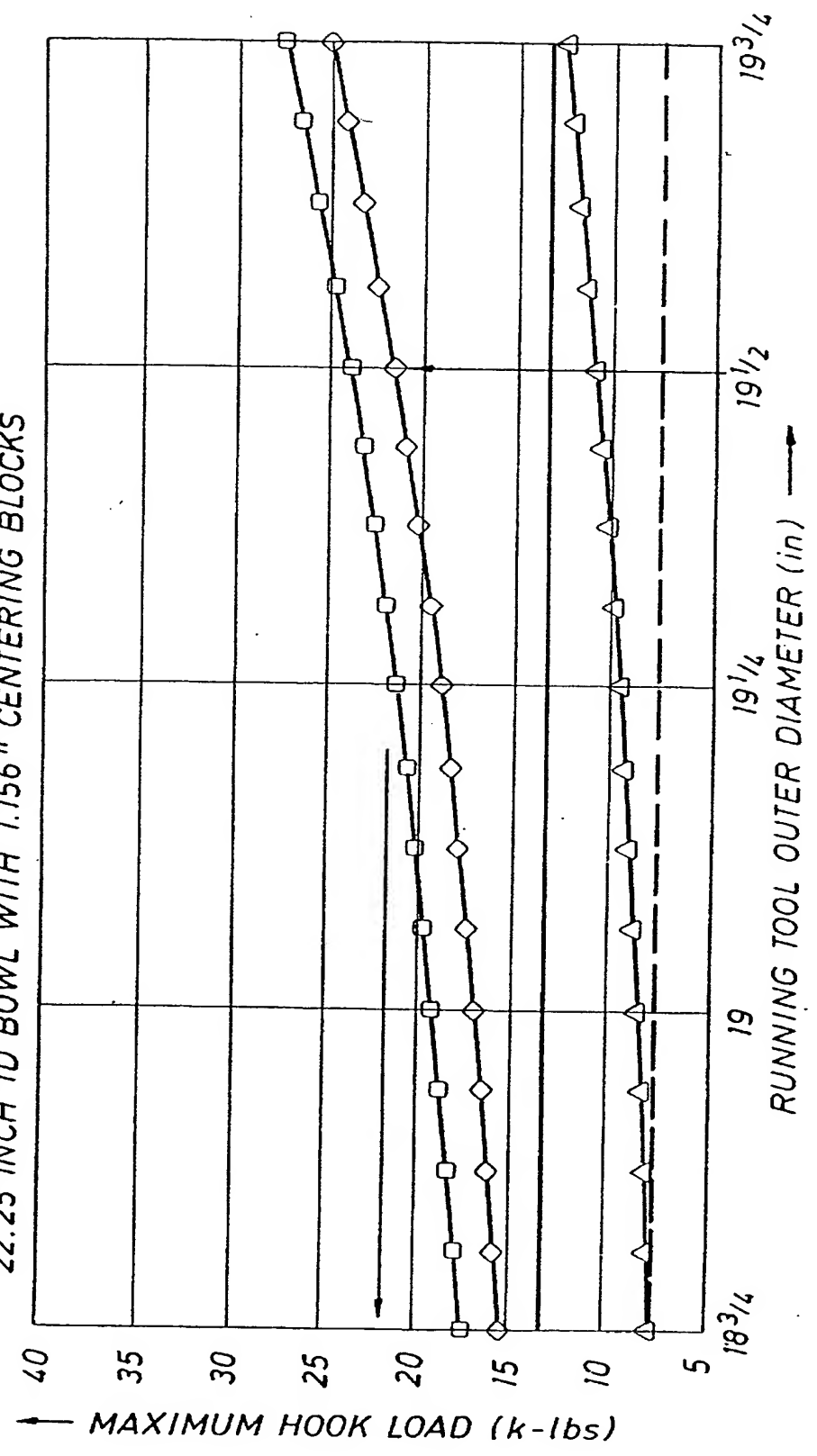


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—◇— MAX HOOK LOAD - ECENTRIC RUNNING TOOL
 —□— MAX HOOK LOAD - TAPERED PINS
 —△— MAX PIN LOAD - FULLY ECENTRIC RUNNING TOOL WITHOUT CENTERING BLOCKS
 ——— WORSE CASE INNER BARREL WEIGHT
 - - - MOST LIKELY INNER BARREL WEIGHT
 60,000 psi YIELD STRENGTH IN MATERIAL
 1.5 INCH MINIMUM PIN TAPER DIAMETER
 22.25 INCH ID BOWL WITH 1.156" CENTERING BLOCKS

FIG. 10



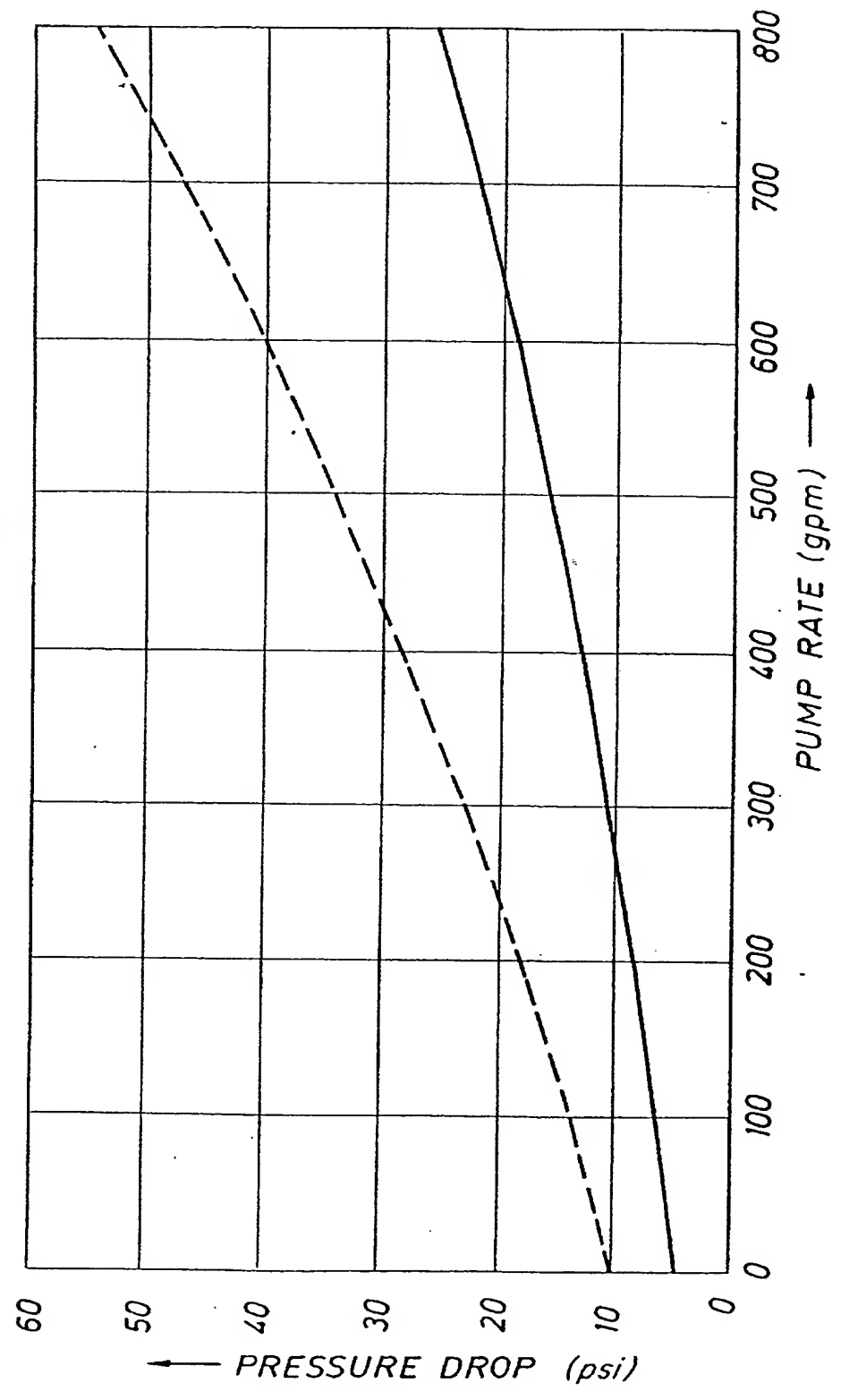
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FIG. 11

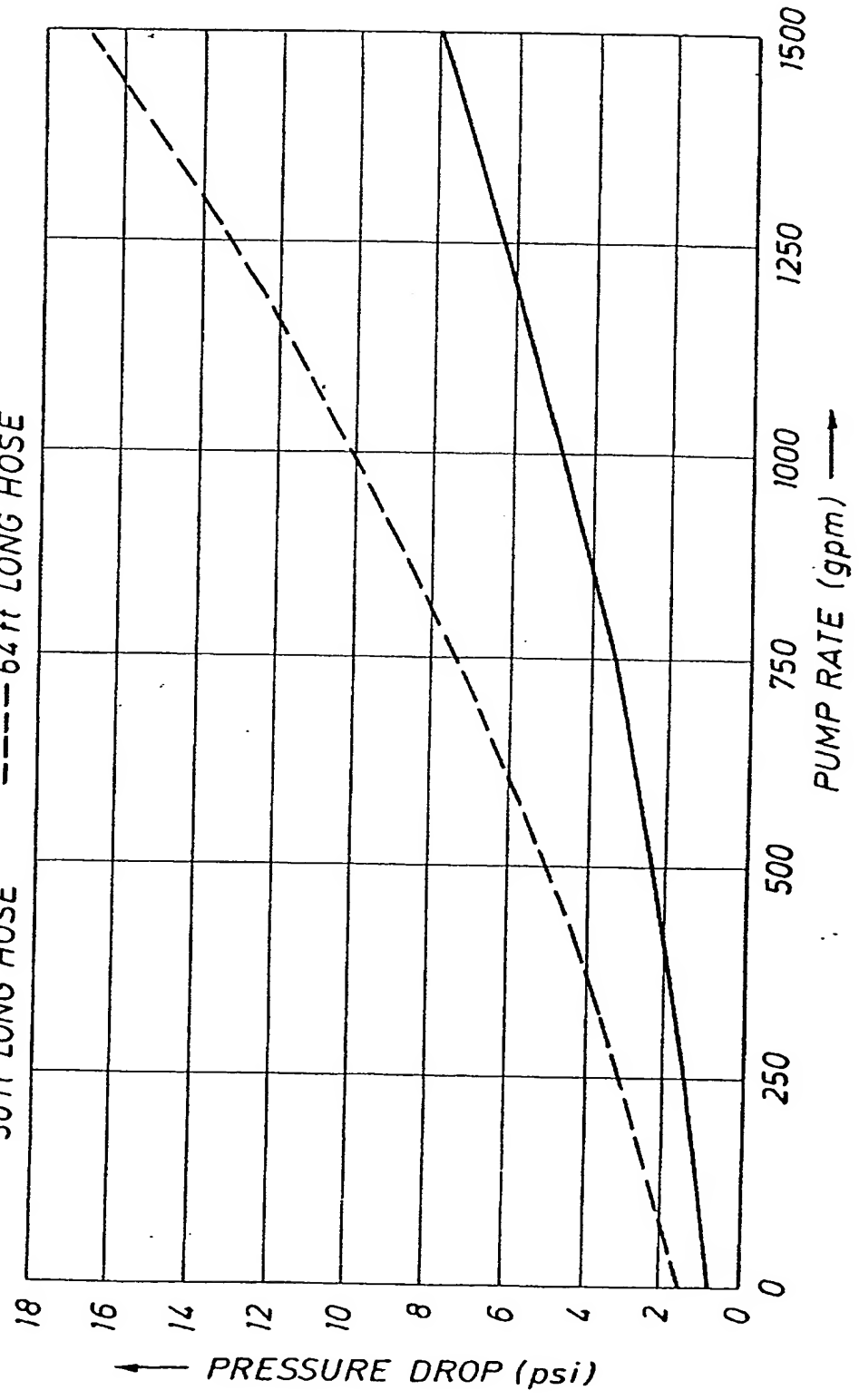
16 ppg MUD, 30 cp vis
10 lb / 100 ft² YIELD
500 gpm BOOSTER PUMP RATE
291 fpm MAX AV IN 9.6 INCH HOLE
85 fpm MAX AV IN 20 INCH RISER
(800 gpm PUMP RATE + 500 gpm BOOSTER PUMP RATE THROUGH HOSE)
—— 30ft LONG HOSE - - - 64ft LONG HOSE



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16 ppg MUD, 30 cp vis
 10 lb/100 ft² YIELD
 500 gpm BOOSTER PUMP RATE
 125 fpm MAX AV IN 18 INCH HOLE
 131 fpm MAX AV IN 20 INCH RISER
 (1500 gpm PUMP RATE + 500 gpm BOOSTER PUMP RATE THROUGH HOSE)
 — 30 ft LONG HOSE - - - 64 ft LONG HOSE

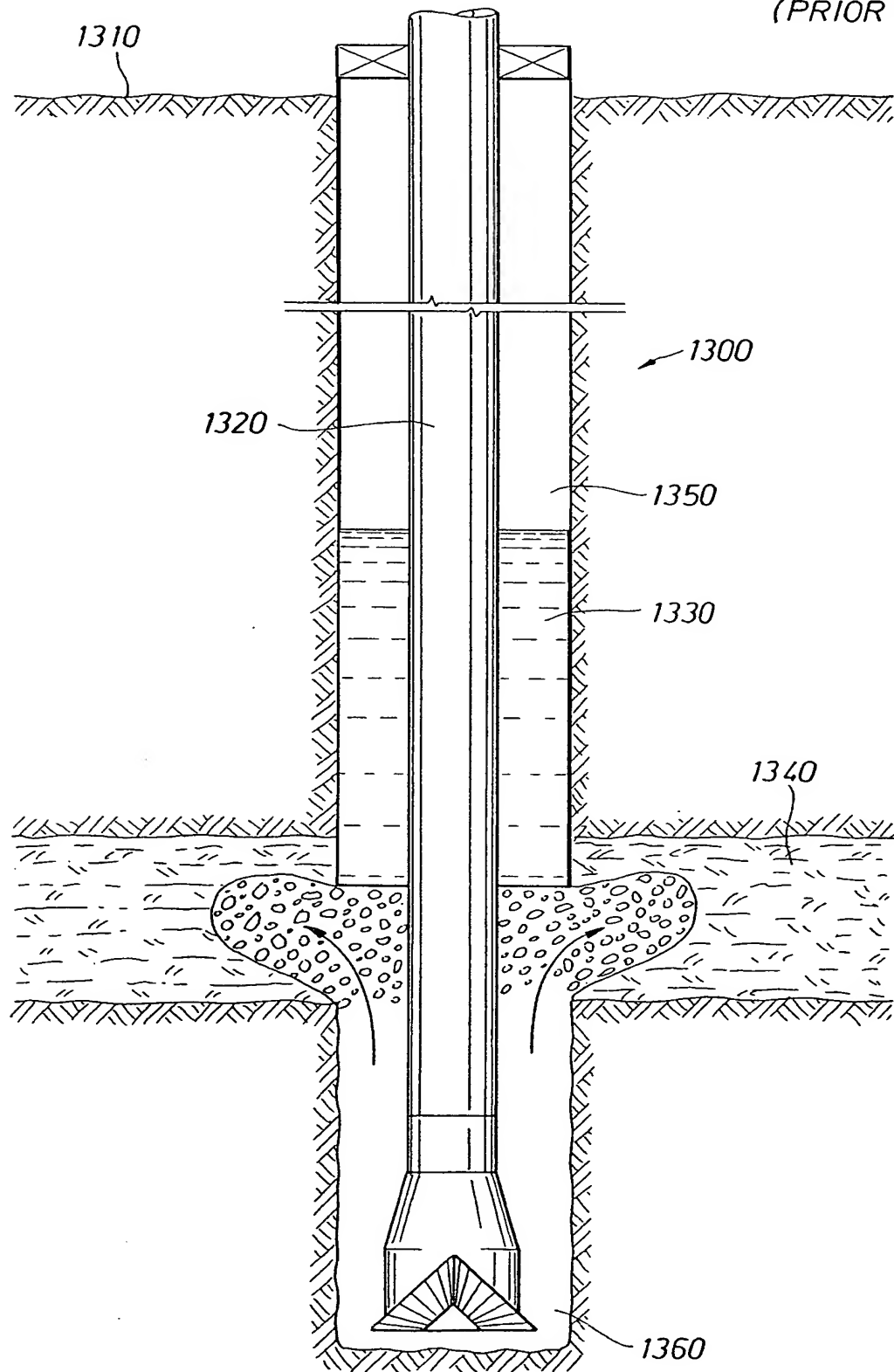
FIG. 12



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FIG. 13
(PRIOR ART)



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FIG. 14

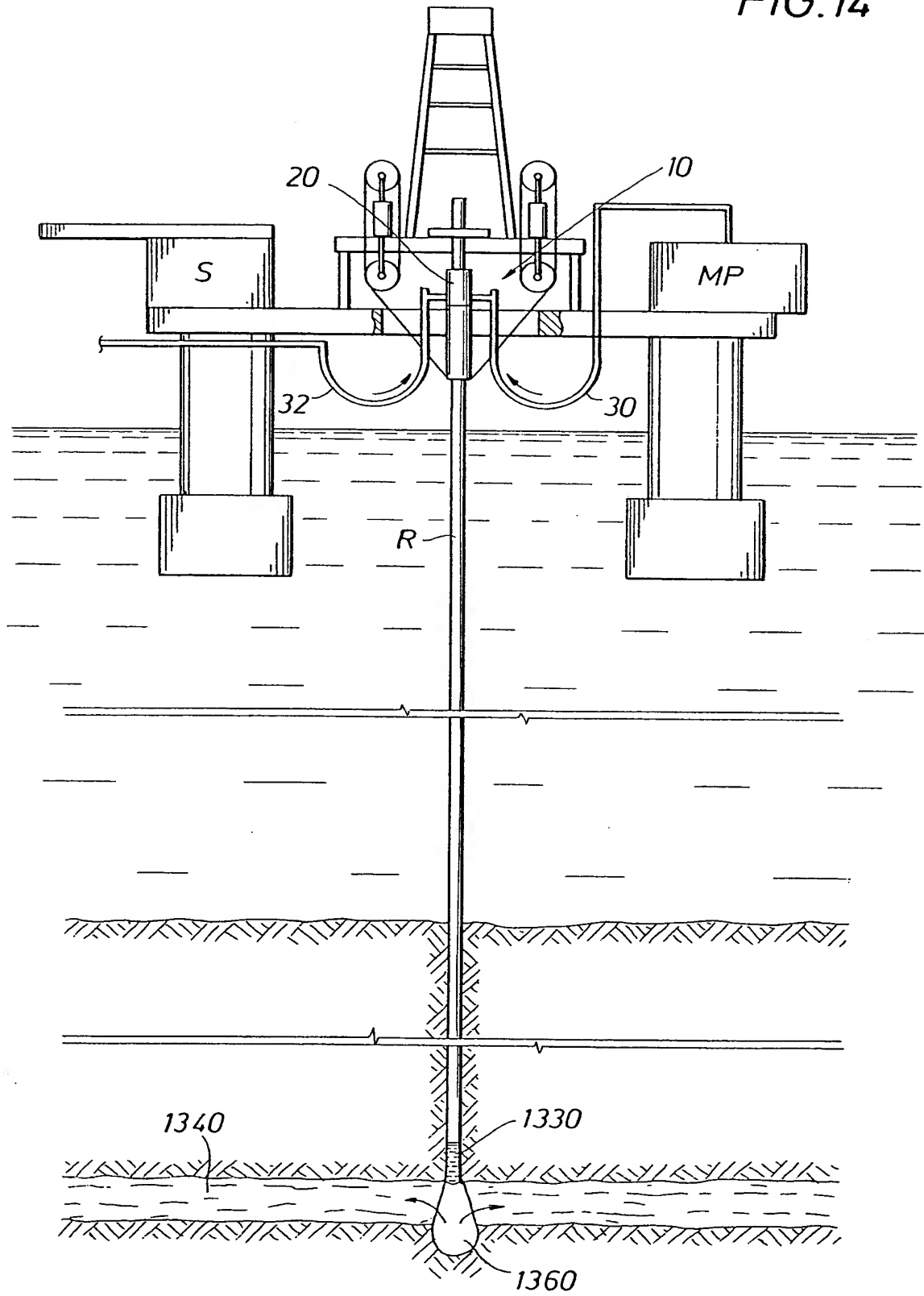


FIG. 15

